

CLAIMS

1. A proximity sensor comprising an illumination means for illuminating a scene with an array of spots of light, a detector arranged to receive light reflected from the scene and a mask, located in the optical path of light from the scene to the detector, the mask having transmissive portions and non-transmissive portions and being arranged, together with the illumination means and detector such that, in use, light reflected from a target from within a first range of distances from the sensor is transmitted through the mask to the detector and light from a second range of distances is not transmitted through the mask.
2. A proximity sensor as claimed in claim 1 wherein the mask is arranged such that reflected light is transmitted to the detector if the target is within a predetermined distance of the sensor and reflected light is not transmitted if the target is outside of that predetermined distance.
3. A proximity sensor as claimed in claim 1 wherein the mask is adapted to transmit light reflected from a target more than a predetermined distance away from the sensor and not transmit light from within the predetermined distance.
4. A proximity sensor as claimed in any preceding claim wherein the illumination means illuminates the scene with spots of infrared light.
5. A proximity sensor as claimed in any preceding claim wherein the illumination means is modulated at a predetermined frequency and a filter is applied to the detector at the predetermined frequency.
6. A proximity sensor as claimed in any preceding claim wherein the detector is adapted to receive ambient light from the scene and compensate for the effects of the ambient light.

7. A proximity sensor as claimed in any preceding claim wherein the mask is adapted to define a plurality of ranges of distance from the sensor and transmit a different amount of reflected light from a target in each distance range.
8. A proximity sensor as claimed in claim 7 wherein the illumination means is adapted to project a plurality of spots at different modulated frequencies and the mask is adapted such that at each range of distance a different modulated frequency is transmitted to the detector.
9. A proximity sensor as claimed in any preceding claim wherein the mask comprises a substantially non transmitting material having a plurality of transmissive windows.
10. A proximity sensor as claimed in any preceding claim wherein the illumination means comprises a light source arranged to illuminate part of the input face of a light guide, the light guide comprising a tube having substantially reflective sides and being arranged together with projection optics so as to project an array of distinct images of the light source towards the scene.
11. A proximity sensor as claimed in claim 10 wherein the light guide comprises a tube with a square cross section.
12. A proximity sensor as claimed in claim 10 or claim 11 wherein the tube comprises a hollow tube having reflective internal surfaces.
13. A proximity sensor as claimed in claim 10 or claim 11 wherein the tube comprises a solid material, arranged such that a substantial amount of light incident at an interface between the material of the tube and surrounding material undergoes total internal reflection.
14. A proximity sensor as claimed in any of claims 10 to 13 wherein the light source comprises an LED.

15. A proximity sensor as claimed in any of claims 10 to 13 wherein the light source comprises an array of LEDs.